Claims

What we claim is:

1. A method of inducing apoptosis of a selected group of vertebrate cells *in vivo*, comprising administering to a vertebrate comprising said cells a thiaminase or derivative or a nucleic acid molecule encoding a thiaminase or derivative, thereby reducing the level of thiamin in said cells.

2. The use of a thiaminase or derivative or nucleic acid encoding a thiaminase or derivative in the preparation of a medicament for the treatment of a disease or condition in a mammal wherein the reduction or elimination of a selected group of cells of said organism produces a therapeutic effect, and

wherein said thiaminase or derivative is able to induce apoptosis by reduction of the level of thiamin.

3. A method for delivering a nucleic acid sequence encoding a thiaminase or derivative to vertebrate cells *in vivo*, comprising the step of contacting said cells with a vector comprising said nucleic acid sequence.

4. A pharmaceutical composition comprising at least one thiaminase or derivative and a pharmaceutically acceptable carrier or excipient.

5. The pharmaceutical composition of claim 4, further comprising a delivery-targeting component.

6. The composition of claim 4, wherein said composition is sterile.

Rule 1.126

7 6. A method of killing a selected group of vertebrate cells *in vivo*, comprising the steps of:

a) contacting said cells with a thiaminase or thiaminase derivative, thereby reducing the level of thiamin in said cells; and

b) administering to a vertebrate animal having said selected group of cells an accessory treatment which enhances the effectiveness of the thiamin reduction.

8 7. A purified, enriched, or isolated nucleic acid sequence encoding a thiaminase or derivative, wherein said thiaminase agent is different from *Bacillus thiaminolyticus* thiaminase I.

9 8. The nucleic acid sequence of claim 7, wherein said thiamin-depleting agent is a *Naegleria gruberi* thiaminase or derivative, or a homolog thereof.

Sub C3 10 9. A eukaryotic expression vector comprising a recombinant nucleic acid sequence of claim 8.

11 10. A vector comprising a recombinant nucleic acid sequence of claim 8, wherein said thiaminase or derivative is different from a thiaminase from *Bacillus thiaminolyticus*.

12 11. A eukaryotic cell transformed with a eukaryotic expression vector comprising a nucleic acid sequence encoding a thiaminase or derivative.

13 12. The eukaryotic cell of claim 11, wherein said cell is *in vivo* in a vertebrate organism.

14 13. A composition for delivery of a nucleic acid sequence encoding a thiaminase or derivative to vertebrate cells *in vivo*, comprising:

a) a nucleic acid sequence encoding said thiaminase or derivative; and

b) a component associated with said nucleic acid sequence which enhances said delivery of said nucleic acid.

15 14. A method of killing a selected group of vertebrate cells in vivo, comprising the steps of:

a) reducing the level of thiamin in said cells by contacting said cells with a thiaminase or derivative; and

b) administering to a vertebrate animal having said selected group of cells an accessory treatment which enhances the effectiveness of the thiamin reduction.

16 15. An isolated, purified, or enriched thiaminase or derivative, wherein said thiaminase is not a Bacillus thiaminolyticus thiaminase.

17 16. The thiaminase or derivative of claim 15, wherein said thiaminase or derivative is a homolog of a *Naegleria gruberi* thiaminase or derivative.

add
C 4